



Science News-Letter

The Weekly Summary of Current Science

Reg. U. S. Pat. Off.

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December 24, 1927

GENERAL SCIENCE

1927 Sees Notable Scientific Advances

Man's mastery of the air was improved, diseases were conquered, new chemicals were produced, the probing of the heavens, unknown lands, and the mysteries of the human past was continued, communication continued to compress the dimensions of the world and the human mind and temperament were further explored in the science researches and achievements of 1927.

Step by step great achievements of science are built. The advances that come to fruition in one year had their foundations laid by the labors of the past year and they will in their turn contribute to the accomplishments of future years.

Some of the principal science achievements and events of 1927 were:

Aeronautics

Col. Charles A. Lindbergh made the first non-stop flight from New York to Paris, the first of a series of successful transoceanic flights by American civilian pilots using commercial aircraft and engines designed and built in the United States.

Aerial express service inaugurated on five routes, including the transcontinental.

Passenger air lines spanning the nation were inaugurated.

Plans for an airship line making the trip from Seville, Spain, to Buenos Aires in three days were announced by the German Zeppelin Works.

More airways were lighted and placed under government supervision.

Airways maps were published by the Coast and Geodetic Survey.

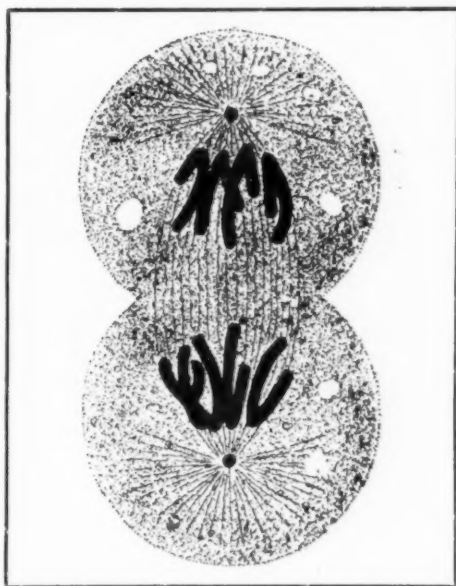
Installation of radio directional beacons and two-way radio communication between plane and ground upon civil airways was begun by Department of Commerce.

Substitute for goldbeaters' skin as gas cell fabric for airships was developed by the U. S. Bureau of Standards, reducing cost one-half and permeability one-half.

Airplanes of novel design, such as the autogiro and Hill's pterodactyle, and special devices such as the Handley Page slot and aileron control, promised to make flying safer.

A committee of weather experts, sponsored by the Daniel Guggenheim Fund for the Promotion of Aeronautics, began an investigation of how the science of meteorology can best aid aviation.

Weather maps showing conditions at



SYMBOLS OF THE ACHIEVEMENTS OF 1927: Above, Chromosomes, bearers of hereditary characters, which X-Rays have been found to affect profoundly. Below, Ray tracks, left by moving atoms, photographed by the method invented by Prof. Wilson of Cambridge and applied by Prof. Compton, of Chicago, who shared this year's Nobel prize in physics



eight different layers, were inaugurated by the Weather Bureau as an aid to aviation.

The utility of the earth inductor compass, the relatively novel means of using the magnetism of the earth for determining direction, was demonstrated when it was used by Trans-Atlantic and Trans-Pacific fliers.

Anthropology and Archaeology

The Glozel tablets in France, alleged to bear the earliest alphabet, continued to cause acrimonious differences of opinion among archaeologists.

Excavations at the Swedish Island of Gothland showed that the medieval city of Visby held great commercial importance because of iron trade.

A concession from the Greek government for the excavation of the Agora of Athens was obtained by the American School of Classical Studies in Athens, and the huge project was assured by financial backing from an anonymous source.

The Italian government undertook the excavation of Herculaneum, overwhelmed in 79 A.D. by the eruption of Mt. Vesuvius.

Digging among the ruins of Pompeii brought to light new houses containing art treasures and wall paintings of great interest.

An ancient Roman naval port, headquarters of the fleet that patrolled the Rhine in the first century A.D. was excavated near Cologne, and many small objects found among the complex ruins.

Prof. Peter Kozloff, planning a new Russian expedition to Tibet, reported the results of his latest discoveries in Mongolia, particularly ruins of an ancient Chinese city.

New light on everyday life of the knights who set out to recapture the tomb of Christ from the heathen was revealed by study of a crusader's castle in Palestine by a Metropolitan Museum of Art expedition.

Two new Canaanite temples were excavated at Beisan by the Palestine Expedition of the University of Pennsylvania Museum.

A museum at Jerusalem for Palestine antiquities was provided by a gift of \$2,000,000 made by John D. Rockefeller, Jr.

Previously unknown Mesopotamian kings who ruled 5,000 years ago, were discovered at Ur of the Chaldees by the joint expedition of the University of Pennsylvania Museum and the British Museum.

A Sumerian temple to the Earth Goddess, built more than 5,000 years ago, was unearthed in the buried city of Kish by the

(Just turn the page)

INDEX TO THIS ISSUE

Almanac, The Nature	415
Apes and Men	415
Baby's Method of Moving	403
Bailey, Liberty Hyde	403
Books in Science, New	415
Brain of Lenin Shows Genius	407
Burns from Cathode Rays	403
Burnside, Lenoir H.	403
Carbon Dioxide, Preparation of	405
Cathode Rays Make Burns	403
Christmas Trees	409
Classics of Science	405

Comet, New, Seen by Astronomers	407
Couch, James F.	403
Corridors of Time, The, Vols. I, II, III	415
Downey, June E.	415
Fleure, John	415
Hunters and Artists	415
Jacobson, Victor C.	403
Kingdom of the Mind, The	415
Leaves Are Uneven Workers	407

Lenin Had Genius Brain	407
Maximow, N. A. and T. A. K.	407
Milk Sickness Poison	403
Mind, The Kingdom of the	415
Nature Almanac, The	415
Pack, Arthur Newton	415
Palmer, E. Laurence	415
Peake, Harold	415
Peasants and Potters	415
Priestley, Joseph	405
Review of Year in Science	401
Robins Winter at Canyon	403

Science, New Books in	415
Science Advances of 1927	401
Skjellerup Comet Seen by Astronomers	407
Soda Water, Preparation of First	405
Trembles, Traces Cause of	403
Vogt, Oscar	407
Waddell, Kenneth C.	403
X-Ray and Cathode Ray Burns Similar	403
Science News-Letter, Dec. 24, 1927	

Scientific Advances, 1927

(Continued from page 401)

Field Museum-Oxford University Joint Expedition to Mesopotamia.

A temple to the Egyptian war-god, Montou, built at about 2200 B.C., was found in Egypt by French scientists, revealing the existence of a hitherto unknown king.

Discovery of a tomb believed that of the great architect Imhotep was reported by Cecil Firth, excavating at Giza for the Egyptian Antiquities Department, and later he reached what appeared to be the entrance to the burial chamber of King Zoser.

Results of an extensive survey of the country of the Hittites in Asia Minor were reported and excavations of a Hittite mound begun by an expedition of the Oriental Institute of the University of Chicago.

The source of the jade-like stone used by the Aztecs was found at Zimapan, by Prof. Ramon Mena, of the Mexican National Museum.

Magnificent frescoes by ancient Maya artists were discovered at Chichen Itza in Yucatan by the Carnegie Institution expedition.

Important ruins of a prehispanic civilization that bridges the gap between the Pueblo culture in the southwest and that of the more advanced culture of the Aztecs and Mayas in southern Mexico were investigated.

A Soviet expedition to Mongolia by Prof. Peter K. Kozloff brought back botanical, zoological and archaeological specimens of great value.

The Rawson-MacMillan Arctic Expedition of the Field Museum, led by Donald B. MacMillan, set out for Labrador and Baffin Land to collect anthropological, botanical, geological, and zoological material.

The general belief that Neanderthal man was a side-shoot from the evolutionary stem with no modern descendants was challenged by Dr. Ales Hrdlicka, of the U. S. National Museum, who holds evidence indicates that Neanderthal man was one of modern man's ancestors.

The evolution of man as such began millions, instead of thousands of years ago, and it was not from an ape-like ancestor, Dr. Henry Fairfield Osborn, of the American Museum of Natural History, declared; while Dr. William K. Gregory of the American Museum of Natural History held that the human race rose in Asia from a distinctly ape-like creature.

Sir Arthur Keith, noted English anthropologist, declared his belief in the descent of man from a distinctly ape-like ancestry, as against the prevailing doctrine that apes and men have parallel but distinct lines of descent.

Skulls dating from a period intermediate between the Old and the New Stone Ages were found in Uganda, Africa, by the Cutler Expedition.

Intact stone graves typical of the ancient

(Turn to page 411)

News-Letter Features

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PSYCHOLOGY

Does a Baby Trot?

Crawling babies do not pace, they trot. This disputed point has at last been shown by the camera, with the cooperation of a group of babies, at the psychological laboratory of Johns Hopkins University.

Results of the experiment, just reported by Dr. Lenoir H. Burnside, show that babies are much more individual in their ways of getting around in the world than older people are. Speaking generally, a human being's first attempts at locomotion are merely struggling forward with much floundering and waving of arms and legs. Later, the baby's arms begin to work, left, right, in alternating rhythm, while his legs are still dragged or hitched after him in most unrhythmic fashion. Then he begins to carry his abdomen clear off the floor, and at last he develops a left, right motion of his legs, alternating them with his arms.

Science News-Letter, December 24, 1927

ORNITHOLOGY

Robins Winter at Canyon

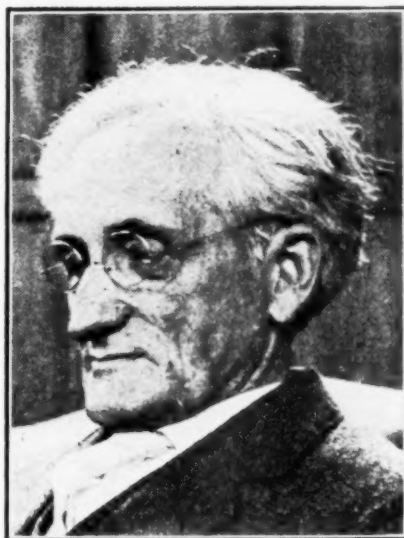
Winter snows have no terrors for robins at the South Rim of the Grand Canyon in Arizona. Although the rim is 6866 feet above sea level, and snow often flies during the winter months, these birds stay throughout the year.

Several reasons have been suggested for this. One is that the birds which remain during the winter—for some of them do migrate when snow flies—are the older birds which have become accustomed to cold and privation, and prefer to take their chances at the Canyon all year rather than make the long flight to a milder climate and back again in the spring. This line of reasoning, however, seems doubtful.

It is more probable that the presence of robins at the Grand Canyon during the winter months is due to the fact that they have no difficulty in obtaining food there, even when the ground is snow-covered, for there is always available an abundance of crumbs and other scraps dear to the robin's palate. Generally the climate is not a severe one, even in winter. Should unusually rigorous weather occur, little robin red-breast is not confined to a choice between wasting his energy on a long hard flight to warmer climes or suffering from the unusual cold at the Canyon's rim. All he need do is volplane downward nearly a mile into the depths of the canyon, where summer reigns throughout the year. Here he can sojourn for a few days, until the storm is over, and then return to the rim for his delicate diet of crumbs.

Science News-Letter, December 24, 1927

BOTANY-HORTICULTURE



LIBERTY HYDE BAILEY

One Wise in Counsel

We are told in the Homeric saga that when the besiegers of Troy faced perplexities they always turned for advice to a certain ruler from Ithaca. There was this good precedent for the selection by the American Association for the Advancement of Science of Liberty Hyde Bailey to sit at the head of its council table during the year now closing. The appropriateness of the choice brooks no question; in all departments of his calling—as botanist, educator, administrator, editor, man of public affairs, Dr. Bailey has labored hard and effectively to advance the interests of the plant sciences, so that election to high office came not as the conferring of a distinction but rather as a recognition of distinction already attained.

Liberty Hyde Bailey was born at South Haven, Michigan, in 1858. He received his fundamental training at Michigan State College, where he also did his first teaching. In 1888 he moved to Ithaca as professor of horticulture at Cornell University; in 1903 he became director of the college of agriculture there, and retained this position for ten years. Since his retirement from active teaching and direction of teaching he has devoted his attention increasingly to writing and publication on botanical, horticultural and humanistic subjects. The books and series he edits are recognized classics: the Standard Cyclopedia of Horticulture, the Cyclopedia of American Agriculture, Rus, Rural Science Series—the list might be continued to great length.

Universities have paid homage to him with honorary degrees, and learned societies abroad with coveted

foreign memberships. But these are things others may boast of. Rarer is the distinction tersely tucked away in a single line in his biographical note: "1882-83, assistant to Asa Gray."

Science News-Letter, December 24, 1927

PHYSIOLOGY-PHYSICS

Cathode Rays Make Burns

Injuries caused by cathode rays, streams of electrons projected from Dr. W. D. Coolidge's recently invented tube, closely resemble burns due to overdoses of X-rays and are similarly stubborn about healing. This is indicated by experiments performed by Dr. Victor C. Jacobson and Dr. Kenneth C. Waddell of the Albany Medical College, to be announced soon in the scientific journal, *Archives of Pathology*.

Rats were used as subjects of the experiments. The animals were wrapped in jackets of copper foil to protect them from being rayed all over, and only a spot about an inch in diameter on the upper abdomen was left exposed.

The first sign of effect by the cathode rays was in the change of hair color, from white to yellow. Then the skin appeared to be tender, and finally developed pronounced sores, which were very slow to heal. When the rats were chloroformed and the skin subjected to microscopic examination, the details of the damage resembled closely those of X-ray burns. The experimenters state that it now appears highly likely that X-ray burns are really due to cathode rays generated by the impact of X-rays on solid or liquid objects which they encounter.

Science News-Letter, December 24, 1927

CHEMISTRY

Milk Sickness Poison

The cause of milk sickness or "trembles," once a deadly scourge of pioneer communities in the Middle West and still a frequent cause of loss to livestock owners, has been traced down by a government scientist, Dr. James F. Couch of the U. S. Department of Agriculture.

It is a compound belonging to the chemical group which contains the alcohols. It occurs in the weed known commonly as white snakeroot or richweed, and to botanists as *Eupatorium urticacifolium*. White snakeroot has long been regarded as the culprit in outbreaks of milk sickness, but just what its active principle was has remained unknown.

Dr. Couch has named his newly-

(Just turn the page)

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Index to Vol. XII.

Milk Sickness Poison

(Continued from page 403)

isolated compound "tremetol," after the old-time designation of the disease it caused, "trembles." It is soluble in fats and in chemical substances which will dissolve fats, such as petroleum ether. Because of this fat-soluble property, animals which have eaten the weed transmit the poison to their milk. Butter made from such milk is also poisonous.

Science News-Letter, December 24, 1927

Is This the Scientific Age?

"Anti-science is something more than mere unscientific thinking, or lack of scientific information. It is an active emotional hostility to science; to its conclusions, and especially to its process of reaching them." From *The Cancer of Ignorance* by Chester H. Rowell.

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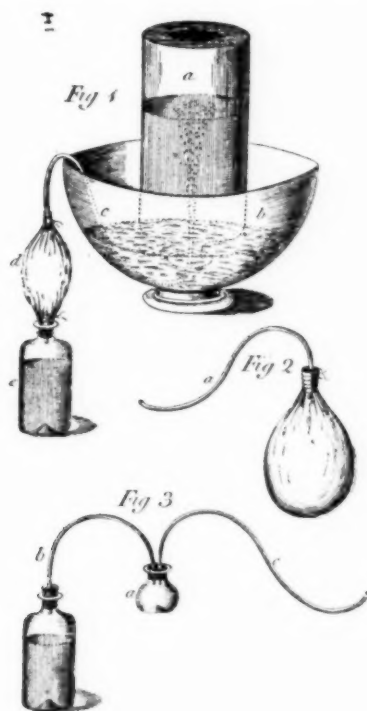
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Classics of Science:

Preparation of Carbon Dioxid



Priestley's illustration of the apparatus he used for making the first soda-water

In repeating the preparation of the first soda-water, the advantage of modern rubber tubing over that made from leather and sewed with waxed thread is obvious. Three sets of apparatus are offered by Priestley. That shown in Figure 3 is the most convenient today, but the others may be attempted by substituting rubber balloons for the bladders, which are not common now. The vessel holding the water to be impregnated with carbon dioxide held 3 pints (British); this is equivalent to 1.7 liters. For the 10-ounce phial substitute a 300 c. c. flask.

DIRECTIONS FOR IMPREGNATING WATER WITH FIXED AIR; In order to communicate to it the peculiar Spirit and Virtues of Pyrmont Water, and other Mineral Waters of a similar Nature. By Joseph Priestley, LL.D., F.R.S., London, 1772.

Directions

If water be only in contact with fixed air, it will begin to imbibe it, but the mixture is greatly accelerated by agitation, which is continually bringing fresh particles of air and water into contact. All that is necessary, therefore, to make this process expeditious and effectual, is first to procure a sufficient quantity of this fixed air, and then to contrive a method by which the air and water may be strongly agitated in the same vessel, without any danger of admitting the common air to them; and this is easily done by first filling any vessel with water, and introducing the

fixed air to it, while it stands inverted in another vessel of water. That every part of the process may be as intelligible as possible, even to those who have no previous knowledge of the subject, I shall describe it very minutely, subjoining several remarks and observations relating to varieties in the process, and other things of a miscellaneous nature.

The Preparation

Take a glass vessel, *a*, fig. 1, with a pretty narrow neck, but so formed that it will stand upright with its mouth downwards, and, having filled it with water, lay a slip of clean paper, or thin pasteboard, upon it. Then, if they be pressed close together, the vessel may be turned upside down, without danger of admitting any, (or, however, much) common air into it; and when it is thus inverted, it must be placed in another vessel in the form of a bowl or bason, *b*, with a little water in it, so much as to permit the slip of paper or pasteboard to be withdrawn, and the end of the pipe *c* to be introduced.

This pipe must be flexible, and air tight, for which purpose it is, I believe, best made of leather, sewed with a waxed thread, in the manner used by shoe-makers. Into each end of this pipe a piece of a quill should be thrust, to keep them open, while one of them is introduced into the vessel of water, and the other into the bladder *d*, the opposite end of which is tied round a cork, which must be perforated, the hole being kept open by a quill; and the cork must fit a phial *e*, two-thirds of which should be filled with chalk just covered with water.

The Process

Things being thus prepared, and the phial containing the chalk and water being detached from the bladder, and the pipe also from the vessel of water; pour a little oil of vitriol upon the chalk and water; and having carefully pressed all the common air out of the bladder, put the cork into the bottle presently after the effervescence has begun. Also press the bladder once more after a little of the newly generated air has got into it, in order the more effectually to clear it of all the remains of the common air; and then introduce the end of the pipe into the mouth of the vessel of water, as in the drawing, and

begin to agitate the chalk and water briskly. This will presently produce a considerable quantity of fixed air, which will distend the bladder; and this being pressed, the air will force its way through the pipe, and ascend into the vessel of water, the water, at the same time, descending, and coming into the bason.

When about one half of the water is forced out, let the operator lay his hand upon the uppermost part of the vessel, and shake it as briskly as he can, not to throw the water out of the bason; and in a few minutes the water will absorb the air; and taking its place, will nearly fill the vessel as at the first. Then shake the phial containing the chalk and water again, and force more air into the vessel, till, upon the whole, about an equal bulk of air has been thrown into it. Also shake the water as before, till no more of the air can be imbibed. As soon as this is perceived to be the case, the water is ready for use; and if it be not used immediately, should be put into a bottle as soon as possible, well corked, and cemented. It will keep however very well if the bottle be only well corked, and kept with the mouth downwards.

Joseph Priestley was born March 13, 1733 (old style), in Yorkshire, England, and died February 6, 1804, at Northumberland, Pennsylvania, U. S. A. As a child his studies included geometry, algebra, natural philosophy, and modern languages, and the rudiments of Latin, Greek, and Hebrew. At nineteen he was sent to Daventry as a non-conformist divinity student, where he stayed three years. In 1761 he became professor of belles lettres at the academy at Warrington, and remained there six years. While there he wrote a History of the Discoveries in Electricity, received an honorary LL.D. from Edinburgh, and became a member of the Royal Society. He left the school for financial reasons and returned to preaching at Leeds, but there he also found time to continue his scientific work. He remained there from 1767 to 1773, then went to live with his patron, the marquis of Lansdowne until 1780. During those years, when he was between the ages of 34 and 47, Priestley carried on his researches on various kinds of "airs" or gases. After that he resided at Birmingham, where he enjoyed the friendship of James Watt, Erasmus Darwin, and other scientific leaders of the time. But Priestley had not risen to fame without making enemies, partly on religious, partly on political grounds, and in 1791 a mob chose the occasion of a celebration of the anniversary of the fall of the Bastille, with which he had little to do, to burn his chapel, destroy his house, and drive him and his family out of the town. He was invited to take charge of an appreciative congregation at Hackney, where he stayed until, in 1794, he decided to join his sons who had gone to America, or, as a contemporary writer put it, "to retire as an exile to the remotest limit of the civilized world."



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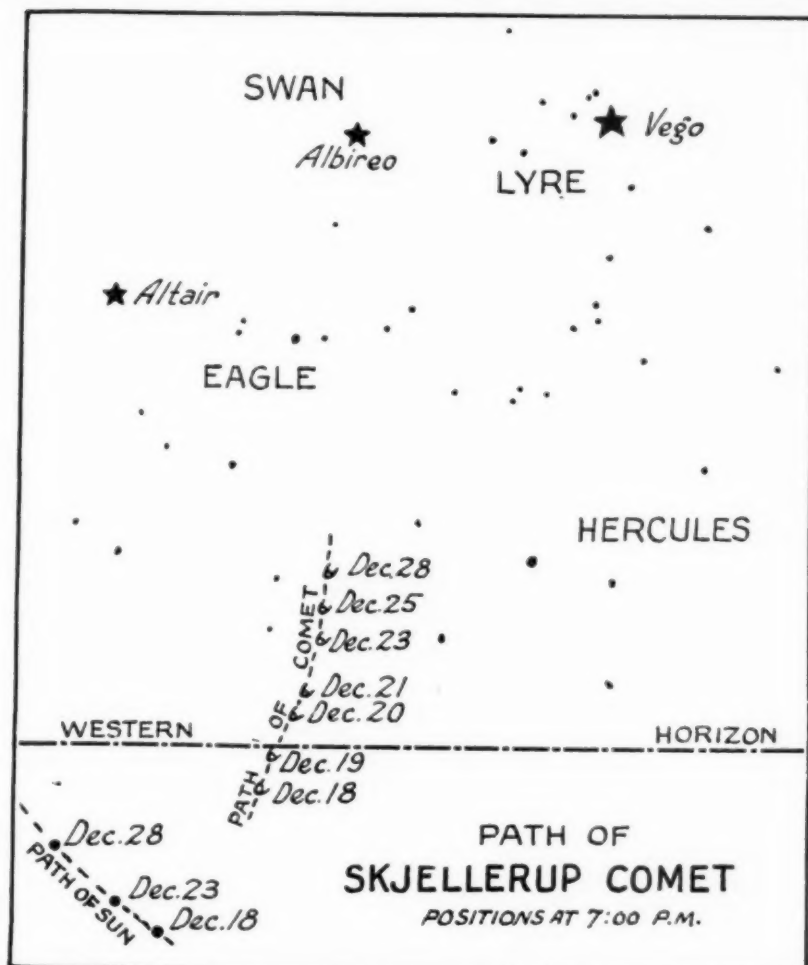
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New Comet Seen by Astronomers



Though later calculations of the path of the new Skjellerup comet have revealed that it is behind the schedule first set for it, several American observers have seen it. Following the first observations by daylight from the Lowell Observatory at Flagstaff, Arizona, it was seen from the Students' Observatory of the University of California, the U. S. Naval Observatory at Washington, and the Yeskes Observatory of the University of Chicago.

On the basis of the latest observations, Leland E. Cunningham of the Harvard College Observatory at Cambridge, Mass., has computed a new ephemeris, as the astronomer calls the comet's time-table, from which the above map is drawn. It is continuing to move in a northerly direction towards the bright star Vega, in the constellation of Lyra, the Lyre, which shines brilliantly low in the northeast now in the early evening. As the comet is still fairly bright, it should be visible for several weeks in the western evening sky after sunset, as a faint patch of light.

The suggestion has been made by A. C. Crommelin, of the British

Royal Observatory, that the Skjellerup comet may be the same as DeVico's comet, which came near the earth in 1846, being number four of that year. He made this suggestion just after the discovery of the new visitor, stating that if this were the case the date of perihelion, when it came nearest the sun, would be December 15. It has turned out very close to this—December 18.

An attempt to observe the comet by the naked eye in daylight from an airplane was unsuccessful when James Stokley, astronomer on the staff of Science Service, made a flight in an Army airplane on Saturday, December 17. Because of the haze near the ground, which obscured the comet, it was thought that an airplane would be able to surmount the haze. An altitude of ten thousand feet was attained. This was higher than the low haze, but a much higher layer still made so much glare near the sun that the comet could not be observed. The flight was made in a Curtis O1 observation plane from Bolling Field, Washington, with Lieut. F. O. Dice as pilot.

Science News-Letter, December 24, 1927

Leaves Uneven Workers

Leaves have long since been convicted of being inefficient workers, utilizing only one or two per cent. of the total sunlight energy they receive. Now they are shown to be very temperamental and uneven in their use of even that pittance, by two Russian plant physiologists, Dr. N. A. Maximow and Dr. T. A. Krasnosselsky-Maximow.

In their experiment leaves of different plants, such as barley, soy beans, buckwheat and millet, were put into flat glass containers without being detached from their parent plants. Air was sucked through the containers, and analyzed as it entered and as it left, to determine how much of the useful carbon dioxide the leaves were extracting from it to manufacture into food. The apparatus was so arranged that determinations could be made in a continuous series making possible a close check on the work of the leaves.

The experiments showed that the intensity of carbon dioxide assimilation, even in such short intervals of time as twenty or thirty minutes, never remains constant. Decreases and increases of as much as 40 per cent. in the rate of intake occurred during a single run of determinations.

The Maximows do not offer an explanation of the fluctuations in the efficiency of leaves as food-making machines. They are sure that the changes are not due to outside causes, but have not yet determined what the internal factors may be. They conjecture, however, that it may be connected with a rhythmic opening and closing of the stomata, or breathing-pores, of the leaves.

Science News-Letter, December 24, 1927

ANATOMY

Lenin Had Genius Brain

The brain of Nikolai Lenin, examined by request of the Soviet government, shows marked characteristics of genius, Prof. Oscar Vogt, director of the Kaiser Wilhelm Institute for Brain Research, has announced.

Professor Vogt found in the Russian leader's brain evidence to support the theory that certain parts of the brain govern certain specific mental functions. This theory has lately been attacked by experiments performed on apes, indicating that if one area of the gray matter is destroyed another may take up its work. Two hundred fields of localization were found in the brain of Lenin.

Science News-Letter, December 24, 1927

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Know Your Christmas Tree

In summer, when all the woods are green, most of us pass the evergreen trees by, to commune with their broad-leaved brethren. Somehow the evergreens, in their heavy robes of dark needles, seem less friendly, less human, more austere than the others. Even the wandering breezes, that set the leaves of maple or poplar to whispering and chattering, only move these reserved old trees to mysterious-sounding murmurs. Longfellow caught their spirit exactly when he likened them to "Druids of eld."

But as Christmas approaches, and our lighter friends of the warmer weather stand like stripped and shivering skeletons, the pines and the hemlocks have their day. Even a Druid is friendlier than a ghost, the more so when he hides among his garments pleasant surprises of siskins and grosbeaks, coaxed to his arms by promise of shelter from the winds and a meal of seeds. We lose a little of our unconscious awe, and become more willing to improve our acquaintance.

There are numbers of evergreen trees to be met with in the course of an afternoon's walk in bright cold Christmas weather, whether one has access to native timber or to cultivated trees in a city park or on suburban lawns. Many of us find ourselves embarrassed in the presence of our Christmas trees, as we do when we essay to introduce a couple of friends and suddenly discover that we cannot remember their names. "I know they are evergreens, but I can't tell them apart," is a common experience.

Yet it is comparatively easy to learn the trick. There are, after all, not very many distinct groups of evergreen trees, and unless one is anxious to get the last fine details of specific distinctions, and hold up his head among professional botanists, he can learn the broad outlines and be able to distinguish the commoner kinds in the course of a single afternoon's ramble. The only thing one needs do is look a little more closely than usual at leaves and bark and cones, and remember a fact or two in connection with each variety.

Pines, though not the favorite Christmas trees, are still widely used, especially in the South. The thing to remember about pines is that their leaves or needles are always found in pairs or little clusters, and that their cones are usually comparatively large, with thick, heavy scales. If the needles are borne singly, or the cones have thin scales, the tree isn't a pine. Among the pines there are two main



Twigs of three conifers much used as Christmas trees: Upper, Spruce; middle, Balsam Fir; lower, Hemlock Fir

groups, the white pines and the yellow. White pines always have their moderately long, rather soft needles in bunches of five; with one unimportant exception the yellow pines never have their needles so arranged. Yellow pine needles usually come in twos, though sometimes in threes or fours. There is only one white pine that is at all common but the yellow pine group is very numerous and includes such trees as the Scotch pine, the jack pine and the long-leaf pine of the South.

The trees most widely used for Christmas purposes in this country are the spruces and firs; in Germany, where Christmas trees originated, the favorite is the hemlock. All of these trees bear their leaves singly, instead of in bunches, as the pines do. Spruces and firs can be further identified by their moderate sized thin-scaled cones, while the cones of the hemlock are very tiny. The spruce has hard, stiff, four-sided prickly leaves that stand out about equally on all sides of the twigs, and its cones hang down. There are two or three native spruces in common cultivation, and one very fine imported one, the Norway spruce, notable for its big cones. The fir has softer, flatter leaves, that are so bent at their bases as to form two rows or ranks, and its cones always stand up.

Bark and cones and needles of the spruce are frequently smeared with exudations of a very sticky resin, which give the tree its other name of "balsam."

The third tree of the spruce-fir triumvirate is a sort of botanical orphan. It is commonly called Douglas fir and sometimes Douglas spruce; but it is neither spruce nor fir. Its lumber is often sold under the name of pine, but it is not a pine. Its technical name is "Pseudotsuga," which is an outlandish combination of a Greek and a Japanese word, meaning "false hemlock," but it is not at all like a hemlock. The poor thing simply hasn't any proper name to call its own. And it is a very proper tree, too. Out in its native Northwest, where trees are trees, its trunks measure in feet what the common forest specimens of the East measure in inches. It would be hard to distinguish from spruce and fir by its foliage alone, for it is about intermediate between them, having needles stiffer than those of the fir but softer than those of spruce. But its cones offer a sure and easy means of identification. Projecting over each scale is a three-pointed appendage or bract which is the unique mark and stigma of the Douglas fir. No other tree has anything resembling it.

The original Christmas tree, famous in song in the land where Christmas is not Christmas without it, is the hemlock. This is the "Tannenbaum" of which the German children sing, and was the sacred tree of the pagan German midwinter feast that was the predecessor of Christmas in the northern lands. It may be known by its very short leaves, ranged in a two-ranked order down the sides of the twigs, and by its very tiny cones. Unlike the other evergreens, it consorts with the climax broadleaf forest on terms of equality. The most magnificent woods this continent ever knew were the beach-maple-hemlock forests of lower Michigan, now, alas, practically wiped out. In them the hemlock was an integral part; other evergreens, in other places, are trees of the rocky places and swamps and burnt-over areas—pioneer trees, hardy and tough and competent to wrest a living from the slenderest resources but unable to face the competition of the faster-growing broad-leaved trees when these invade their stand. The hemlock, therefore, merits special homage.

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Scientific Advances, 1927

(Continued from page 402)

Indian culture that centered at Etowah, Georgia, were donated to a number of American museums by Prof. Warren K. Moorehead of Phillips Academy, Andover, Mass.

German autopsies on 30,000 Egyptian mummies showed that decayed teeth increased progressively as the Egyptians became more civilized and that syphilis was practically non-existent in ancient Egypt.

The trail of ancient man in the far northwest was followed by ethnologists of the Smithsonian Institution, who collected material from old burials and studied customs in Alaska.

The "Burnt Rock" mounds in Texas were found to contain records of three prehistoric Indian civilizations.

Skeletons of the transition period at the time when prehistoric Indians of the Southwest changed from the basket-making age to the pottery-making age were found at Chaco Canyon, New Mexico.

Bones of extinct animals discovered together with stone implements in Oklahoma, Texas, and New Mexico, were examined by a number of scientists who declared that they indicate the existence of man on this continent during the glacial period.

The theory that clothing was first adopted by primitive men chiefly as a protection against insects, was advanced by Dr. Knight Dunlap, professor of psychology at Johns Hopkins University.

The Huxley Memorial Medal of the Royal Anthropological Society was presented to Dr. Ales Hrdlicka, anthropologist of the U. S. National Museum.

Astronomy

An amateur astronomer named Blathwayt, at Braamfontein, South Africa, discovered a new comet on January 13.

An amateur astronomer, William Reid of Rondebosch, South Africa, discovered a new comet on January 26.

The Pons-Winnecke comet, which made one of its sexennial visits to the earth's neighborhood, was detected on March 3 by Dr. George Van Biesbroeck, of the Yerkes Observatory, Williams Bay, Wis. It came within 3,500,000 miles of the earth on June 27, closer, with one exception, than any comet had been known to come in the past.

A new comet was discovered on March 10 by Dr. Carl L. Stearns of the Van Vleck Observatory of Connecticut Wesleyan University.

The Grigg-Skjellerup comet was discovered on March 30 by Dr. George Van Biesbroeck, of the Yerkes Observatory.

An Australian justice of the peace and amateur astronomer, Walter F. Gale, discovered a new comet on June 7.

Schaumasse's periodic comet was observed on its return on October 4 by Prof. Van Biesbroeck, of the Yerkes Observatory, and possibly by Gerald Merton, of the British Royal Observatory a little earlier.

Encke's comet, a periodic visitor, was found on November 12, as it came near the earth again, by Prof. George Van Biesbroeck, of the Yerkes Observatory.

A naked eye comet visible in both the northern and southern hemispheres was discovered December 3 by J. F. Skjellerup, Australian amateur, and was visible just before Christmas.

A new star was located in the Milky Way by Dr. Max Wolf, of the Heidelberg Observatory in Germany.

A comet and a nova, or new star, were discovered within three days by two Ger-

man astronomers, Drs. A. Schwassman and Wachmann.

Prof. Joel Stebbins of the University of Wisconsin announced the discovery that the satellites of Jupiter always keep the same side turned toward their parent planet, just as the moon does toward the earth.

An eclipse of the sun on June 29, visible in England and Norway, was seen at certain points along the path of totality by astronomers from the British Royal Observatory and the Hamburg Observatory in Germany though American astronomers in Norway were unable to see any of it on account of cloudy weather.

The aid of the Canadian Mounted Police, Catholic missionaries to the Eskimos, fur trappers and others was asked by Dr. Willard J. Fisher, of the Harvard College Observatory, in observing the total eclipse of the moon on June 15.

Discovery of just how the solar radiation varies was announced by Dr. C. G. Abbot, of the Smithsonian Institution.

Many large sunspots were observed, and magnetic storms on the earth took place in apparent conjunction with them.

The possibility that stars may be liquid was advanced by Prof. J. H. Jeans, English astronomer.

Basalt, a rock common on the earth, is not present on the surface of the moon, Dr. Fred E. Wright, of the Carnegie Institution, told members of the National Academy of Sciences, in reporting a series of studies he had made with a new instrument.

The sun and the nearby stars may be in a vast cloud of cosmic "dust," said Prof. Edward S. King, of Harvard Observatory, thus causing the more distant stars to appear redder than the nearer ones, an effect that has actually been observed.

The radius of the universe was estimated as one hundred million light years by Prof. E. T. Whittaker of Edinburgh University, in a report to the British Association for the Advancement of Science.

In the hands of amateur astronomers in all parts of the world, his invention, the spectrohelioscope, may go far towards solving outstanding solar mysteries, Dr. George Ellery Hale, honorary director of the Mt. Wilson Observatory, declared.

A 60-inch reflecting telescope, the largest in the southern hemisphere and the third largest in the world, was ordered for the new South African station of the Harvard College Observatory, which will replace the former station at Arcquipa, Peru.

The solar wave lengths in the unexplored regions of the spectrum were mapped by the U. S. Bureau of Standards in cooperation with Allegheny Observatory.

The largest disk of optical glass ever cast in the United States was made by the U. S. Bureau of Standards, the reflecting telescope blank being of borosilicate crown glass, 70 inches in diameter and 12½ inches thick.

Biology

A ten-million-dollar war was waged against the European corn borer in the Corn Belt states by the Department of Agriculture and declared successful.

Three botanists, Dr. A. B. Stout, Dr. Ralph McKee and E. J. Schreiner announced the development of a fast-growing hybrid poplar to meet the demands for wood pulp.

Cells, usually assumed to be short-lived, were found still living in the heartwood of redwood trees a century old, it was reported by Dr. D. T. MacDougal, of the

Carnegie Institution of Washington, and Dr. G. M. Smith, of Stanford University.

The Tennessee State Supreme Court, in a decision on appeal in the famous Scopes case, declared the anti-evolution law constitutional, but so worded its decision as virtually to nullify the law. John Scopes was excused from paying the fine levied against him for violating the statute, because of an error on the part of the judge presiding at his trial.

Efforts made in thirteen states to pass anti-evolution statutes were unsuccessful.

X-rays applied to the reproductive cells of animals and plants were found to speed up the rate of evolutionary change over a thousand per cent. This work was done on fruit flies by Prof. H. J. Muller of the University of Texas and on tobacco plants by Prof. T. H. Goodspeed and Prof. A. R. Olson of the University of California. Numerous other investigators are now actively engaged in research on the biological effects of X-rays.

Natural evolutionary changes in shell fish within 60 years, producing distinctly recognizable animal varieties in a lake in Wisconsin, were reported by Dr. Frank C. Baker, curator of the museum of natural history of the University of Illinois.

Chemical affinities between the milks of related animals were discovered by Prof. H. R. Marston of the University of Adelaide.

Eggs of the marine worm, Nereis, were fertilized without fathers, by the use of an electric current, in the laboratory of Dr. Ware Cattell of Memorial Hospital, New York City.

Dr. Barnett Sure of the University of Arkansas has shown by experiments with rats that a poorly nourished mother, whose bodily stock of vitamin B is subnormal, becomes unable to pass along this necessary food element to her nursing offspring.

The female sex hormone, or gland essence that causes typically feminine reactions and development in animals, was discovered in male animals as well as female, by Dr. Otfried O. Fellner of Vienna.

The tuberculin testing of fowls to weed out avian tuberculosis was advocated by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry, at the Third International Poultry congress held at Ottawa, Canada.

Mathematic studies of athletic records show that the one for the 880-yard run should be most easily broken, Dr. Earle R. Hedrick, of the University of California, stated.

Dr. Raymond Pearl, director of the Institute for Biological Research at the Johns Hopkins University, announced a theory based on laboratory observation of yeast, bacteria and fruit flies, that biological and human populations rise and fall in accordance with a universal law.

Congress passed a bill to provide for the collection and care of a herd of the nearly extinct Texas longhorn cattle, in the Wichita National Forest, Oklahoma.

A program for the scientific study and administration of the great elk herds of the Yellowstone region was planned by a co-operative committee of the national, state and private bodies interested.

The first International Congress of Soil Science was held in Washington in June and attracted scientists from many foreign countries.

A serious plague of mice occurred in Kern County, Calif., during January and February.

(Just turn the page)

Scientific Advances, 1927

(Continued from page 411)

A new mosquito poison based on formaldehyde and said to be the most efficient yet devised, was announced by E. Boubaud of the Pasteur Institute of Paris.

Rediscovery of the straight-billed reed runner, a bird of Uruguay first noted by Darwin in 1831, of which all trace had been lost for nearly 100 years, was made by C. C. Sanborn, of the Captain Marshall Field South American Expedition, of the Field Museum.

Chemistry

Experiments by H. S. Cooper of Cleveland, Ohio, showed that the light-weight metal beryllium or its alloys is suitable for airship frames and light-weight pistons.

The new chemical element rhenium was obtained in pure form by its original discoverers, Drs. Walter and Ida Noddack.

Metallic vanadium was obtained for the first time by J. W. Marden and M. N. Rich, of the Westinghouse Lamp Co.

A record making deposit of borax, in the form of a new mineral called rasorite, was discovered in California by C. M. Rasor.

Prof. David I. Macht of Johns Hopkins University announced that polarized light speeded the growth of certain plants, and had other effects on life.

That the germs of tuberculosis contain a previously unknown compound, a phosphorous-containing fat, was discovered by Prof. R. J. Anderson, of Yale University.

Making of synthetic rubber from coal on a commercial scale was announced by the German chemical trust.

Electroplating of rubber from latex or colloidal solutions of rubber was developed upon an industrial scale.

Hydrogenation of coal to produce liquid fuels resembling petroleum reached the point of commercial application.

Progress in the further synthesis of chemicals from cheap raw materials was made.

Cornstalks were utilized experimentally as a source of cellulose for paper and artificial silk.

New denaturants for alcohol were developed, some of them being produced by synthesis from petroleum products.

The U. S. Bureau of Standards discovered that duralumin can be protected against corrosion by coating with pure aluminum.

Engineering

The U. S. Army developed a new fire-control instrument for anti-aircraft artillery, which makes it possible for one man to aim any desired number of guns.

A new 3-inch anti-aircraft gun firing 15-pound shells at the rate of about one every two seconds was developed by the U. S. Army.

The six-mile Moffat tunnel under James Peak, Colo., was completed.

The Holland vehicular tunnel between New Jersey and New York City was opened to traffic.

The United States Steel Corporation inaugurated an extensive program of research into the fundamental problems of the industry.

A device for detecting one part of mercury in 20,000,000 parts of the atmosphere was developed by the General Electric Company.

Diphenyl oxide, a white chemical with a powerful odor like geraniums, was experimented with as a substitute for water in steam boilers, in an endeavor to increase their efficiency.

More durable paper currency resulting from tests of the U. S. Bureau of Stand-

ards resulted in estimated savings of one million dollars a year.

An acoustical plaster which absorbs most of the sound falling upon it was developed by the U. S. Bureau of Standards.

Methods of making low-cost roads of gravel sand and clay were developed.

Geology and Geography

Scientists of 25 nations, meeting at Prague, passed resolutions recommending an international cooperative study of ocean depths.

Floods in the lower Mississippi Valley and in New England were the worst that had ever been recorded.

That the Mississippi floods may be due to the gradual sinking of the lower valley of the river, closer and closer to sea-level, was suggested by Dr. David E. White, eminent geologist of the National Research Council and the U. S. Geological Survey.

Disastrous tornadoes struck Louisiana, Mississippi, Texas, Oklahoma, Illinois, Arkansas, Kansas, Missouri and Washington, D. C. St. Louis was particularly damaged.

Large quantities of oil may be deposited below the bottom of the sea, said Dr. Parker D. Trask, of the American Petroleum Institute.

Discoveries of potash salts in Texas and New Mexico thick and rich enough for mines were discovered through test boring made by the U. S. Geological survey.

Seven thousand square miles in southeastern Alaska were surveyed by aerial mapping through the cooperation of the Navy and the U. S. Geological Survey.

Two large areas in Alaska totaling 7,800 square miles, were explored by scientists of the U. S. Geological Survey, discovering and mapping a high mountain region hitherto unknown and finding a volcano in eruption.

A great earthquake on May 22 in the Kansu province in interior China was announced to the world on the following day by Science Service, in cooperation with the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association, though it was not for many weeks later that actual reports from the devastated region reached civilization.

Other severe earthquakes during the year that were immediately located by the co-operation of these three bodies included those in Chile, April 14 and November 14, Japan, March 27; Alaska, October 24 and California on November 4.

The heat of Kilauea, the world's largest volcano, was measured by means of borings made in its floor by Dr. T. A. Jaggar, director of the Hawaii Volcano Observatory.

Medicine

The 1927 Nobel prize for medicine was awarded Prof. Julius Wagner-Jauregg of Vienna for his treatment of paresis by inoculation with malaria.

Cancer in the chicken can be rendered inactive by small quantities of aluminum and calcium salts, Mrs. Margaret R. Lewis and Dr. Howard B. Andervont discovered.

A "heart hormone," or internal secretion that stimulates the heart to keep it beating, was discovered by Dr. Ludwig Haberlandt of the University of Innsbruck.

Thyroxin, the hormone of the thyroid gland, was made synthetically in the laboratory of University College, London, by C. R. Harington and Prof. George Barger. Dr. C. R. Harington and Prof. George Barger.

Dr. J. J. Abel of the Johns Hopkins University has prepared a crystalline insulin

(Turn to page 413)



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Scientific Advances, 1927

(Continued from page 412)

which appears to be a pure hormone necessary for the maintenance of normal sugar metabolism.

"Synthalin," a German preparation designed to supplement or replace insulin in the treatment of diabetes, was at first widely hailed, but proved a disappointment.

Discovery of a new drug, "myrtilin," as a valuable treatment for diabetes was announced to the American Medical Association, by Dr. Frederick M. Allen, of Morristown, N. J.

Liver extract can be used to cure pernicious anemia, Drs. George R. Minot, William P. Murphy and E. J. Cohn, of Harvard University, announced; also the latter extracted from liver an extract which produces red corpuscles and probably is the active ingredient.

A diet that simulates a condition in the body brought about by starvation, has been found by Drs. F. B. Talbot, K. M. Metcalf, and Margaret E. Moriarty at the Massachusetts General Hospital in Boston to give successful results in treating epileptic children.

Vitamin C, the substance that wards off scurvy, is present in milk as well as in the fresh vegetables usually relied on to supply it, was the report by Prof. L. F. Meyer, following extensive experiments at the University of Berlin.

Ergosterol was declared to be the really active and essential substance in the antirachitic vitamin, by a number of investigators working independently of each other.

Dr. Alfred F. Hess of New York reported that dried milk that has been treated with ultra violet light is the most practical of the irradiated foods that have been used to prevent rickets in babies.

Preventive vaccination for smallpox and typhoid, large quantities of quinine and elaborate mosquito control measures contributed to checking outbreaks of disease epidemics in the South after the Mississippi flood.

Drs. E. G. Wakefield and W. W. Hall of the U. S. Navy Medical Corps completed a systematic survey of heat injuries and one of the first investigations into the physiological reactions underlying sunstroke.

Scientists at Berlin have showed that it is possible to change simple embryonic tissues into malignant tissue by exposing the former in tissue cultures to the action of arsenic.

Discovery of the germ causing trachoma, a serious disease of the eye that has been especially troublesome among the Indians, was announced by Dr. Hideyo Noguchi, of the Rockefeller Institute, New York.

A curative antitoxin for erysipelas, first developed by Dr. K. E. Birkhaug, of Rochester, N. Y., has been tried out with highly successful results at the Bellevue Hospital in New York, which has one of the largest clinics in the world.

Streptococcus germs isolated from skin lesions of erysipelas are capable of causing sore throat without any skin affection, it was found by Drs. George F. and Gladys H. Dick, at the John McCormick Institute for Infectious Diseases.

Progress in the work of developing a serum to fight the African sleeping sickness was announced by Dr. William H. Tallafero, of the University of Chicago.

A color test for tetanus and diptheria toxins has been worked out by Drs. Lucy Mishulow and Charles Krumwiede of the New York City Health Department, that will greatly speed up the commercial pro-

duction of these products. Hitherto toxins have had to be tested out on live guinea pigs, a time consuming and not altogether accurate procedure.

Dr. Florence B. Seibert of the University of Chicago has produced an active protein in crystalline form, which represents a step nearer the solution of the actual chemical nature of tuberculin.

Statistical evidence that the first born child in a family is more likely to have certain malformations of mind and body than later children, and that such malformations are not likely to recur in later births in the same family, was presented by Dr. G. F. Still, professor of children's diseases at King's College, London.

The utility of X-ray photographs of the head as a positive means of identification was demonstrated by Drs. William L. Culbert and Frederick M. Law, of New York, when they identified an unknown body with their aid.

Heart disease occurs less frequently in children who have had their tonsils removed than in those who have not, said Dr. A. D. Kaiser, of Rochester, N. Y., before the American Medical Association.

An extract from the liver of dogs that will keep blood from clotting was discovered by Dr. W. H. Howell, of Johns Hopkins University.

A new anesthetic known as avertin that lacks many of the undesirable features of the anesthetics now in use, is being tried out in German hospitals.

A new and accurate chemical test for drunkenness, by which the subject's breath is passed through a chemical solution, was demonstrated to the American Medical Association by Dr. Emile Bogen, of the University of Cincinnati.

The Metropolitan Life Insurance Company announced that their statistics showed that America has had more deaths from alcoholism since Prohibition than before.

Physics

A new theory of the mechanics of atoms was enunciated by the Swiss physicist, Schrodinger, which, in brief, holds that electrons and other units of matter are wave systems like ordinary light and X-rays.

The 1927 Nobel prize for physics was awarded jointly to Prof. Arthur H. Compton of the University of Chicago and Dr. C. T. R. Wilson of Cambridge University, England, for their researches on X-rays and radium radiation.

The tercentennial of the death of Isaac Newton was celebrated by scientists all over the world.

Dr. Dayton C. Miller of the Case School of Applied Science at Cleveland, Ohio, repeated experiments that may show that the earth is drifting through the ether.

Sound waves vibrating far too rapidly to be heard produced such curious effects as the emulsion of a candle in water, Prof. R. W. Wood, of Johns Hopkins University said, in describing to the National Academy of Sciences work which he had performed in collaboration with Alfred L. Loomis.

Cathode rays from the tube recently invented by Dr. W. D. Coolidge of the Research Laboratory of the General Electric Company have been found to be like sunlight in their power to give certain substances the quality of preventing rickets.

An instrument known as the thermionic microammeter, able to measure one five-billionth of an ampere, was developed by the laboratory of the General Electric Company at Lynn, Mass.

The grid glow relay, invention of D. D.

Knowles, Westinghouse engineer, which operates on a billionth of a watt of electrical power, was demonstrated.

Discovery of a new electrical insulator was announced by Dr. Abram Joffe, a Russian scientist visiting the United States.

A highly successful process of television, by wire and radio, the development of the Bell Laboratory under the direction of Dr. Herbert E. Ives, was demonstrated on April 7.

The televox, an apparatus by which the telephoned note of a tuning fork can be used to extinguish lights, start and stop electric fans, and operate other devices, was exhibited by its inventor, R. J. Wensley.

The non-magnetic ship Carnegie was overhauled preparatory to a lengthy scientific cruise to begin next year.

Metal shrinks when it is magnetized, Prof. S. R. Williams of Amherst College stated.

The conclusion that nebulium, the strange "element" supposed to exist in such bodies as the great cloud of glowing gas in the star group of Orion, is merely oxygen and nitrogen, was reached by Dr. I. S. Bowen, of the Norman Bridge Laboratory of Physics.

Dr. Paul R. Heyl, of the U. S. Bureau of Standards announced the determination after three years work of the Newtonian constant of gravitation as the fraction 6.664 over a hundred million; a value ten times more accurate than the previously accepted value.

The "quantum," the "atom" of which modern physicists suppose that light and other radiations consists, may be divided, was indicated by experiments by Dr. A. J. Dempster, of the University of Chicago.

The wind velocity of the hurricane that wrecked Miami on September 18, 1926, was determined as 132 miles an hour, which was declared the highest on record by Benjamin C. Kadel of the Washington, D. C., weather bureau.

Psychology

Statistics from Massachusetts, the first state to round up its entire new generation of feeble-minded in order to develop them into useful citizens, reveal the great number of such children now being wasted, Dr. Neil A. Dayton of the Massachusetts Department of Mental Diseases reported.

The experiment of caring for mental patients in a general hospital has been tried and found successful, and this method of care has many advantages, Dr. Thomas J. Heldt, of the Henry Ford Hospital in Detroit, reported.

Environment rather than heredity was shown to be the great cause of insanity according to a fifteen-year investigation of 28,000 individuals who died on Cape Cod in the past fifty years, reported by Dr. L. Vernon Briggs, psychiatrist.

American Psychiatric Association advocated adoption of laws to put the psychiatrist in court in the position of counselling the legal authorities as to the sanity and disposal of social offenders.

Tests to determine whether prospective school teachers will make good in the school room or not, were devised and put to use by Prof. F. A. Moss and his assistants at the psychology department of George Washington University.

Dr. Knight Dunlap, professor of psychology at the Johns Hopkins University, reported experiments that indicate the mouth is a more expressive feature of the face than the eyes.

(Turn to page 415)

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First Glances at New Books

THE KINGDOM OF THE MIND—June E. Downey—Macmillan (\$2).

This might be called a "cafeteria psychology." The reader waits on himself. He gets more fun than having everything served to him while he sits still and swallows it. Also he learns more that way. In fact the only way to learn anything really is to do it yourself. Especially anything about yourself.

Here are simple practical tests by which a boy can find out how to improve his game, however good that is. How a girl can find out how to improve her temper, however bad that is. How to test the accuracy of your senses and the quickness of your reaction time and the retentiveness of your memory and the originality of your imagination; in short how to inventory your mental stock in trade on which your future fortune depends.

This is the third volume of "The Young People's Shelf of Science," edited by Science Service to carry sound science to folks in their teens, but folks of several teens can profit by them.

Science News-Letter, December 24, 1927

I. APES AND MEN. II. HUNTERS AND ARTISTS. III. PEASANTS AND POTTERS—Harold Peake and John Fleure—Yale University Press (\$2 each). These three volumes are the first of a series of eight, published under the series title, *The Corridors of Time*. This initial triad carries the story of primitive man from his earliest beginnings down through the New Stone Age. The series as projected will carry through to the beginnings of Greece and Rome. The books are written in an excellently clear style and the illustrations are pertinent and well made. Best of all, the authors have kept clear of the facile dogmatism into which it seems to be so easy to fall when writing the history of men who left no history.

Science News-Letter, December 24, 1927

THE NATURE ALMANAC—Arthur Newton Pack and E. Laurence Palmer—American Nature Association (\$1). Compacted into this manual is a great mass of information on nature study associations, courses and teachers all over the country. A comprehensive series of nature book bibliographies is an especially valuable feature.

Science News-Letter, December 24, 1927

GENERAL SCIENCE

New Books In Science

Industrial progress is largely dependent upon science; and scientific and technical workers—whether engaged in research or in industrial pursuits—find their endeavors greatly facilitated by the published records of results attained by other workers. It is thus essential that scientific and technical men be kept informed regarding new books in their respective fields.

The Publishers' Weekly, the American Book Trade Journal, gives prompt notice of new books published in the United States, merely listing books of all classes, alphabetically by names of authors.

The Cumulative Book Index supplements the above service by arranging books by authors, titles, and subjects. It appears several times a year but cumulates the year's output in a final annual volume.

Book trade lists are published for the more important foreign countries, also, and it is thus possible to learn what books have been published. These trade lists, however, include both technical and non-technical books; and in all these lists the entries are very brief, giving merely titles, prices, publishers and, in some cases, the dates and number of pages. But book titles are often ambiguous or incomplete and, with the high cost of present-day technical books it is usually desirable to have further information before purchasing. Book reviews in scientific, technical, and trade journals (though not always ably written) afford the best information, but these reviews are widely scattered and few individuals find it possible to keep in touch with reviews in any large number of journals.

The Technical Book Review Index, issued quarterly by the Technology Department of the Carnegie Library of Pittsburgh, is the only publication devoted to recording reviews of new books in the fields of science and technology. It constitutes a record of the reviews in several hundred journals and includes many books published abroad. Its chief function is to cite accurately the sources and length of the review, but information is also given regarding pages, price, date, and publisher. Also, whenever possible, extracts from reviews are quoted, so that in many cases the reader gets, directly from the *Index*, sufficient evaluation of the book without consulting the reviews at all. The *Technical Book Review Index* is not intended to compete with existing book

trade publications in suggesting books on any subject. It is, therefore, arranged alphabetically by names of authors. Incidentally (since the best books are the ones most likely to be reviewed) it is possible for the user to glance through the *Index* and quickly note the important works in his field. Each issue forms a pamphlet of 130 to 150 pages, and some 6,000 reviews are recorded annually. The price is 25 cents a copy or \$1.00 a year.

Science News-Letter, December 24, 1927

Scientific Advances, 1927

(Continued from page 413)

Contrary to the usual notion that men of genius are physically frail, a study of several hundred great musicians of the past two centuries shows that they were an unusually healthy lot on the whole. Dr. James F. Rogers of the U. S. Bureau of Education reported.

A child gorilla's use of its hands was studied by Dr. R. M. Yerkes, of Yale University.

A study of why high school students fail in their course revealed that in a large percentage of cases teachers do not realize the basic causes of failure.

The effect of noise on a typist's efficiency, tested by Dr. Donald Laird at Colgate University, showed that the typist could keep up her accuracy only at the expense of speed and with a heavy drain on her energy.

Allowing children to give way to their impulses was denounced by Dr. Charles W. Burr, neurologist, who urged teaching children to control their emotions as a means of race improvement.

Adults up to the age of 50 learn better than children, experiments by Dr. E. L. Thorndike, professor of psychology at Columbia University, showed.

The nerve center which controls emotions was located as a very small section of the optic thalamus, in the old primitive part of the brain, as a result of experiments by Dr. Philip Bard at the physiological laboratory of the Harvard Medical School.

Radio

The International Radio telegraph Conference revised the world laws governing radio.

Reception of short length radio signals was found to improve during periods of high sunspot activity.

The experience of the U. S. S. Kittery with a radio compass during hurricane weather indicated that the intensity of static may be of use in detecting and locating these disastrous storms at a distance.

Five-meter wave experiments by the General Electric Company shows that these short waves seem to cast shadows much like light.

Quartz plate was developed by the U. S. Bureau of Standards as a standard of radio frequency, bringing agreement between frequency standards of different nations to three parts of 100,000.

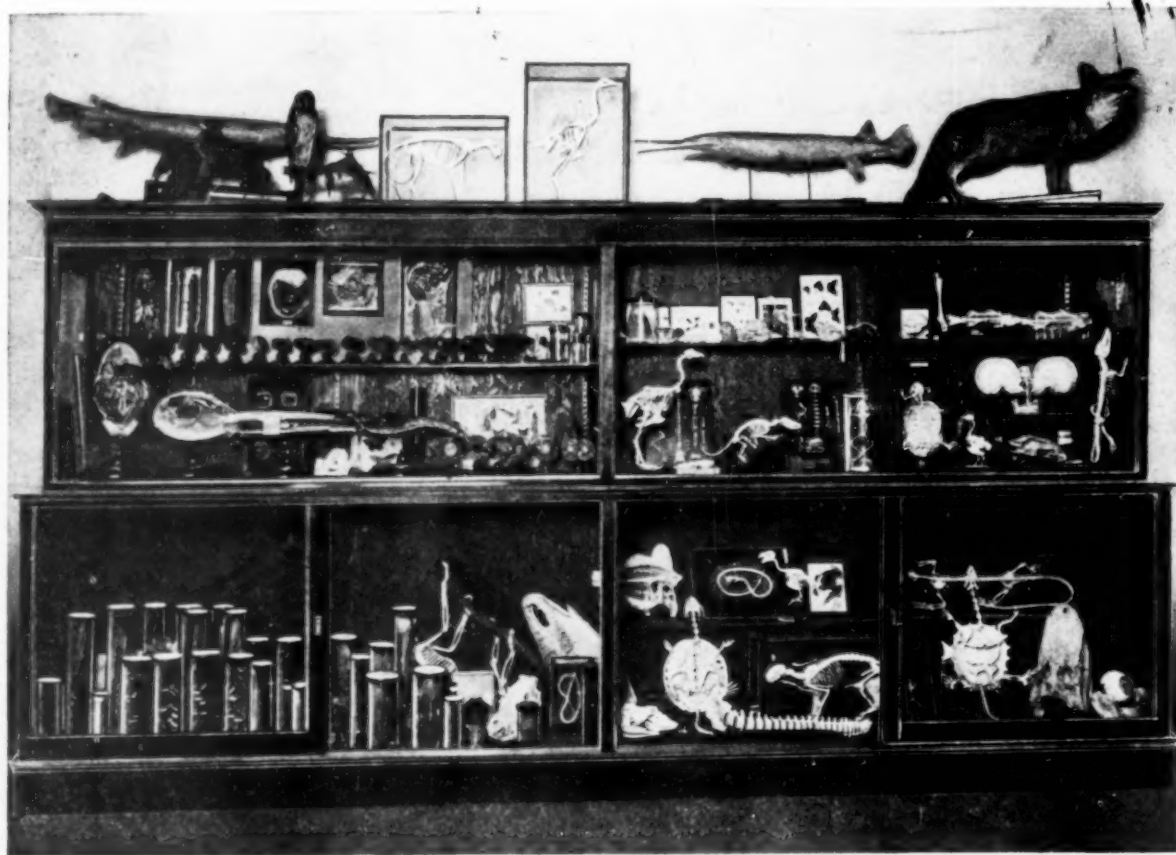
Station WGY at Schenectady operated on 100 kilowatt power using the world's largest vacuum power tube of that power.

Broadcasting upon low wavelengths was begun, necessitating adapters to most ordinary receiving sets.

Electron tubes operating directly on house supply alternating current were developed.

Science News-Letter, December 24, 1927

Demonstration Materials for the Biological Sciences



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